

...2012-2013 RAIN YEAR PRECIPITATION SUMMARY...

SUMMARY FOR THE SAN FRANCISCO BAY AREA AND MONTEREY BAY AREA...

THIS SUMMARY IS FOR THE RAIN YEAR THAT BEGAN ON JULY 1 2012 AND ENDED JUNE 30 2013.

RAINFALL TOTALS FOR THE 2012-2013 RAIN YEAR WERE BELOW THE 30-YEAR AVERAGE (ALSO KNOWN AS THE NORMAL) AT ALL CLIMATE STATIONS ACROSS THE SAN FRANCISCO BAY AREA AND MONTEREY BAY AREA. MOST LOCATIONS ACCUMULATED BETWEEN 60 AND 80 PERCENT OF THEIR NORMAL YEARLY RAINFALL. RAIN TOTALS FOR THE PREVIOUS RAIN YEAR (2011-2012) WERE BELOW NORMAL BY A SIMILAR AMOUNT.

THE PRIMARY DISTINGUISHING CHARACTERISTIC OF THE 2012-2013 RAIN YEAR WAS ITS VERY DRY SECOND HALF. ALSO NOTEWORTHY WAS HOW DRY CONDITIONS FROM JANUARY ONWARD CONTRASTED SHARPLY WITH A RELATIVELY WET START TO THE RAINY SEASON. NOVEMBER AND DECEMBER WERE WET MONTHS WITH RAINFALL TOTALS WELL ABOVE NORMAL. THEN...IN JANUARY...A PERSISTENT DRY WEATHER PATTERN DEVELOPED AND RAINFALL REMAINED WELL BELOW NORMAL FOR MOST OF THE REMAINDER OF THE RAINY SEASON. IN FACT...COMBINED RAIN TOTALS FOR THE FIRST FIVE MONTHS OF 2013 WERE THE LOWEST JANUARY-MAY TOTALS ON RECORD FOR MOST CLIMATE STATIONS ACROSS THE REGION.

RAINFALL TOTALS FOR THE FIRST HALF OF THE RAINY SEASON (JULY-DECEMBER) WERE ABOUT 120-150% OF NORMAL...WHILE TOTALS FOR THE SECOND HALF (JANUARY-JUNE) WERE ONLY 15-25% OF NORMAL.

FOR THE ENTIRE RAIN YEAR MOST CLIMATE STATIONS ACROSS THE SAN FRANCISCO AND MONTEREY BAY AREAS RECEIVED BETWEEN 60-80% OF THEIR NORMAL YEARLY RAINFALL. SAN FRANCISCO ACCUMULATED 16.61 INCHES OF RAIN DURING THE 2012-2013 RAIN YEAR WHICH IS 70% OF THE CITY'S AVERAGE YEARLY RAINFALL AMOUNT OF 23.65 INCHES. THE 2012-2013 RAIN YEAR WAS THE 41ST DRIEST ON RECORD IN SAN FRANCISCO. RAINFALL RECORDS IN SAN FRANCISCO SPAN 164 YEARS...DATING BACK TO 1849.

HIGHLIGHTS OF THE 2012-2013 RAIN YEAR ARE SUMMARIZED BELOW:

JULY 2012:

MOST INLAND AREAS PICKED UP NO MEASURABLE RAINFALL DURING JULY. SOME AREAS NEAR THE COAST PICKED UP SMALL AMOUNTS OF PRECIPITATION FALLING FROM MARINE LAYER CLOUDS.

AUGUST 2012:

MONSOONAL MOISTURE SURGED NORTHWARD ACROSS THE REGION ON SEVERAL OCCASIONS DURING AUGUST. ON A FEW OCCASIONS THAT MOISTURE COMBINED WITH RISING MOTION IN THE MID LAYERS OF THE ATMOSPHERE AND THE RESULT WAS DEVELOPMENT OF HIGH BASED THUNDERSTORMS (SOMETIMES REFERRED TO AS ELEVATED CONVECTION BECAUSE THE THUNDERSTORMS DEVELOP IN A LAYER OF THE ATMOSPHERE ABOVE THE BOUNDARY LAYER). THE FIRST EPISODE OF ELEVATED CONVECTION OCCURRED ON SATURDAY AUGUST 4. SCATTERED HIGH BASED THUNDERSTORMS DEVELOPED

OVER SOUTHEASTERN MONTEREY COUNTY AND SOUTHERN SAN BENITO COUNTY DURING THE LATE MORNING HOURS OF THE 4TH. LATER THAT DAY...A THUNDERSTORM ALSO CLIPPED THE NORTHEASTERN CORNER OF CONTRA COSTA COUNTY. THIRTY-FIVE CLOUD-TO-GROUND LIGHTNING STRIKES WERE DETECTED ACROSS THE REGION ON THE 4TH...MOST OF THEM OVER FAR SOUTHEASTERN MONTEREY COUNTY AND FAR SOUTHERN SAN BENITO COUNTY.

THE SECOND THUNDERSTORM EVENT OCCURRED OVER THE NORTH BAY DURING THE PRE-DAWN HOURS OF SATURDAY AUGUST 18. SIX CLOUD-TO-GROUND LIGHTNING STRIKES WERE DETECTED OVER NORTH-CENTRAL NAPA COUNTY.

BECAUSE BOTH THUNDERSTORM EVENTS IN AUGUST WERE ELEVATED WITH A DEEP LAYER OF DRY AIR UNDER THE PRECIPITATING CLOUDS...MOST RAINFALL EVAPORATED PRIOR TO REACHING THE GROUND. AS A RESULT...RAINFALL AMOUNTS FROM A TRACE TO JUST A FEW HUNDREDTHS WERE REPORTED. THE ONLY OTHER SOURCE OF RAINFALL DURING AUGUST WAS DRIZZLE FALLING FROM MARINE LAYER STRATUS CLOUDS...MAINLY NEAR THE OCEAN. FORT ROSS...ON THE SONOMA COUNTY COAST...PICKED UP NEARLY A QUARTER OF AN INCH OF DRIZZLE DURING THE MONTH OF AUGUST.

SEPTEMBER 2012:

SEPTEMBER 2012 WAS A DRY MONTH. MOST CLIMATE STATIONS PICKED UP NO MEASURABLE RAINFALL. MOST OF THE MEASURABLE RAIN THAT FELL AT SCATTERED LOCATIONS ACROSS THE REGION OCCURRED DURING THE 5TH AND 6TH WHEN MID AND UPPER LEVEL MOISTURE FROM POST-TROPICAL STORM JOHN WAS ADVECTED NORTHWARD BY A WEAK UPPER LOW OFF THE CALIFORNIA COAST. SCATTERED LIGHT SHOWERS AND ISOLATED THUNDERSTORMS DEVELOPED ON THE MORNING OF THE 5TH AND MOVED FROM SOUTH TO NORTH ACROSS THE REGION. ONE MORE ISOLATED THUNDERSTORM MOVED ACROSS SAN JOSE ON THE MORNING OF THE 6TH. THE SHOWERS AND THUNDERSTORMS ON THE 5TH AND 6TH PRODUCED...AT MOST...ONLY A HUNDREDTH OR TWO OF RAINFALL AT OFFICIAL WEATHER SERVICE CLIMATE STATIONS.

OCTOBER 2012:

THREE EARLY SEASON WEATHER SYSTEMS BROUGHT PRECIPITATION TO THE REGION DURING THE MONTH OF OCTOBER. THE FIRST PRECIPITATION EVENT OCCURRED FROM THE 9TH THROUGH THE 12TH WHEN A SLOW MOVING UPPER LEVEL LOW PRESSURE TRIGGERED WIDELY SCATTERED SHOWERS AND ISOLATED THUNDERSTORMS. RAINFALL AMOUNTS WERE GENERALLY LIGHT. HOWEVER...THUNDERSTORMS THAT DEVELOPED OVER THE SOUTHERN SANTA CLARA COUNTY ON WEDNESDAY AFTERNOON OCTOBER 10 PRODUCED LOCAL BRIEF HEAVY RAIN AND HAIL. THERE WERE SEVERAL REPORTS OF HAIL AROUND 1/4 INCH IN DIAMETER FROM LOS GATOS SOUTH THROUGH THE SANTA CLARA VALLEY. THE LARGEST HAIL FELL IN GILROY AT APPROXIMATELY 3:40 PM THAT AFTERNOON. HAILSTONES AS LARGE AS 1 INCH IN DIAMETER WERE OBSERVED IN GILROY...PROMPTING THE ISSUANCE OF A SEVERE THUNDERSTORM WARNING FOR PORTIONS OF SANTA CLARA AND SANTA CRUZ COUNTIES. NEARLY THREE-QUARTERS OF AN INCH OF RAIN FELL ACROSS PORTIONS OF GILROY ON THE 10TH...FAR EXCEEDING RAIN TOTALS FOR ANY OTHER LOCATION THAT DAY.

THE SECOND PRECIPITATION EVENT DURING OCTOBER OCCURRED FROM THE 22ND THROUGH THE 25TH AS A BROAD UPPER TROUGH ORIGINATING IN THE GULF

OF ALASKA SLOWLY DEEPENED ALONG THE WEST COAST. MOST PRECIPITATION WITH THIS WEATHER SYSTEM OCCURRED DURING THE MORNING OF MONDAY OCTOBER 22 AS A STRONG COLD FRONT SWEEPED THROUGH THE AREA. THUNDERSTORMS THAT FORMED BEHIND THE FRONT THAT AFTERNOON PRODUCED AT LEAST FOUR TORNADOES IN THE SACRAMENTO VALLEY AND ADJOINING SIERRA NEVADA FOOTHILLS. NO SEVERE WEATHER OCCURRED IN THE SAN FRANCISCO BAY AREA THAT DAY...BUT THE WEATHER DID ACT TO ENHANCE THE DRAMA OF A DECISIVE BASEBALL GAME. A LINE OF SHOWERS FORMED JUST NORTH OF SAN FRANCISCO EARLY ON THE EVENING OF THE 22ND AS THE SAN FRANCISCO GIANTS AND SAINT LOUIS CARDINALS PLAYED THE SEVENTH GAME OF THE NATIONAL LEAGUE CHAMPIONSHIP SERIES AT AT&T PARK. THE SHOWERS REMAINED JUST TO THE NORTH OF THE BALLPARK UNTIL THE LATE INNINGS. A DOWNPOUR THEN DEVELOPED IN THE FINAL INNING AS THE GIANTS WRAPPED UP THEIR 9-0 VICTORY OVER THE CARDINALS...SECURING A SPOT IN THE WORLD SERIES. RAIN TOTALS WITH THIS SECOND OCTOBER PRECIPITATION EVENT WERE AS HIGH AS 2 INCHES IN THE NORTH BAY...BUT MOST AREAS PICKED UP BETWEEN ONE-QUARTER AND ONE INCH OF RAIN.

THE THIRD AND FINAL RAIN EVENT OCCURRED ON THE FINAL DAY OF THE MONTH. A SLOW MOVING COLD FRONT SPREAD RAIN FROM NORTHWEST TO SOUTHEAST ACROSS THE REGION LATE ON HALLOWEEN.

NOVEMBER 2012:

A COLD UPPER TROUGH DEEPENED ALONG THE WEST COAST FROM THE 7TH THROUGH THE 9TH. THE AIRMASS COOLED SUFFICIENTLY BY THE 9TH FOR SNOW TO FALL AT HIGHER ELEVATIONS. MOUNT HAMILTON PICKED UP AN INCH OF SNOW ON THE 9TH.

A SERIES OF WEATHER SYSTEMS BROUGHT LIGHT TO MODERATE AMOUNTS OF RAIN TO THE AREA FROM THE 16TH THROUGH THE 21ST.

DURING THE LAST FEW DAYS OF NOVEMBER A SIGNIFICANT WEATHER PATTERN CHANGE DEVELOPED OVER THE EASTERN PACIFIC. A DEEP UPPER TROUGH FORMED OFF THE WEST COAST AND A FLOW OF VERY MOIST AIR ORIGINATING IN THE TROPICS TOOK AIM AT NORTHERN CALIFORNIA. THE FIRST IN A SERIES OF STORMS MOVED ASHORE ON WEDNESDAY THE 28TH. THIS FIRST STORM MOVED THROUGH RATHER QUICKLY AND SO RAINFALL TOTALS WERE ONLY MODERATE...MAINLY LESS THAN AN INCH AT LOWER ELEVATIONS. AS MUCH AS TWO INCHES FELL IN THE NORTH BAY MOUNTAINS.

THE NEXT STORM SYSTEM BEGAN TO PUSH ONSHORE ON THE FOLLOWING DAY. THIS ONE CONTAINED MORE MOISTURE THAN THE FIRST AS IT ENTRAINED A NARROW PLUME OF ENHANCED MOISTURE (SOMETIMES REFERRED TO AS AN ATMOSPHERIC RIVER). RAIN BECAME HEAVY IN THE NORTH BAY ON THE NIGHT OF THE 29TH...AND AN AREA OF HEAVY RAIN THEN MOVED SLOWLY SOUTH ACROSS THE REST OF THE REGION ON FRIDAY THE 30TH. BECAUSE THIS STORM CONTAINED A GREAT DEAL OF MOISTURE...AND BECAUSE IT MOVED SLOWLY...RAINFALL TOTALS WERE MUCH HIGHER COMPARED TO THE STORM THAT MOVED THROUGH A FEW DAYS EARLIER. BY THE END OF FRIDAY THE 30TH...RAINFALL ACCUMULATIONS RANGED FROM 1 TO 3 INCHES AT LOWER ELEVATIONS AND FROM 3 TO 7 INCHES IN THE HILLS. A FEW ISOLATED LOCATIONS IN THE SONOMA AND MONTEREY COUNTY COASTAL MOUNTAINS PICKED UP MORE THAN EIGHT INCHES OF RAIN. NUMEROUS FLOOD ADVISORIES WERE ISSUED ON FRIDAY THE 30TH AND ONE FLASH

FLOOD WARNING WAS ISSUED FOR A PORTION OF MONTEREY COUNTY.

THE WET STORM SYSTEM ON THE LAST DAY OF THE MONTH CONTRIBUTED SIGNIFICANTLY TO NOVEMBER'S RAINFALL TOTALS. IN FACT...THE RAIN THAT FELL ON THE 30TH WAS ANYWHERE FROM 30 TO 50 PERCENT OF THE TOTAL FOR THE MONTH AT MOST CLIMATE STATIONS AND AS MUCH AS 60 PERCENT OF THE TOTAL FOR SOME LOCATIONS IN MONTEREY COUNTY. HAD IT NOT BEEN FOR THE RAIN ON THE 30TH...RAINFALL TOTALS FOR NOVEMBER WOULD HAVE BEEN ONLY NEAR NORMAL...OR EVEN BELOW NORMAL...AT MOST LOCATIONS. BUT THE DELUGE ON THE 30TH HELPED PUSH THE MONTHLY TOTALS WELL ABOVE NORMAL...EVEN AS MUCH AS TWICE NORMAL IN SOME LOCATIONS.

DECEMBER 2012:

DECEMBER 2012 WAS AN ACTIVE WEATHER MONTH ACROSS THE REGION. MEASURABLE RAIN FELL ON NEARLY HALF OF ALL DECEMBER DAYS. TWO PRECIPITATION EVENTS PRODUCED HEAVY RAIN. THE FIRST OF THESE WAS AT THE BEGINNING OF THE MONTH AND THE SECOND A FEW DAYS BEFORE CHRISTMAS ON THE 22ND AND 23RD.

THE WET AND WINDY WEATHER THAT BEGAN ON NOVEMBER 28 CONTINUED THROUGH DECEMBER 2. ALTHOUGH PERIODS OF HEAVY RAIN OCCURRED DURING THESE FIVE DAYS...THE SOIL PRIOR TO THIS SERIES OF STORMS WAS RELATIVELY DRY AND CAPABLE OF ABSORBING MUCH OF THE PRECIPITATION. CONSEQUENTLY...ONLY MINOR NUISANCE FLOODING OCCURRED...MAINLY IN LOW-LYING URBAN AREAS.

A DEEP AND WET UPPER LEVEL LOW PRESSURE TROUGH DEVELOPED OFFSHORE BY DECEMBER 20. THIS WEATHER SYSTEM BEGAN TO SPREAD RAIN ACROSS THE AREA ON THE FIRST DAY OF WINTER...DECEMBER 21. HEAVY RAINFALL WAS INITIALLY CONFINED TO THE NORTH BAY. AS MUCH AS 6 INCHES OF RAIN FELL IN NORTHWEST SONOMA COUNTY ON THE 21ST...BUT RAIN AMOUNTS FARTHER TO THE SOUTH WERE SIGNIFICANTLY LIGHTER. MOST AREAS SOUTH OF THE GOLDEN GATE PICKED UP LESS THAN A HALF INCH OF RAIN ON THE 21ST. THEN...LATE ON THE NIGHT OF THE 21ST A ROBUST COLD FRONT APPROACHED THE REGION. THIS COLD FRONT PRODUCED A LINE OF INTENSE SHOWERS AND ISOLATED THUNDERSTORMS THAT RUMBLED THROUGH THE SAN FRANCISCO BAY AREA DURING THE PRE-DAWN HOURS OF SATURDAY DECEMBER 22. THESE SHOWERS AND ISOLATED THUNDERSTORMS THEN MOVED THROUGH THE MONTEREY BAY AREA AROUND SUNRISE THAT MORNING. ONE THUNDERSTORM GENERATED A WATERSPOUT OVER MONTEREY BAY AND WEAK TORNADO NEAR WATSONVILLE.

RAINFALL TAPERED OFF SATURDAY AFTERNOON AND SATURDAY NIGHT BUT THEN ONE FINAL FRONTAL RAIN BAND MOVED ACROSS THE REGION ON SUNDAY THE 23RD...PRODUCING A PERIOD OF HEAVY RAIN THAT AFTERNOON. BECAUSE THE SOIL HAD BEEN SATURATED BY RECENT SUBSTANTIAL RAINFALL...RUNOFF ON THE 23RD WAS HEAVY AND RESULTED IN RAPID RISES ON AREA RIVERS AND CREEKS. THE NAPA RIVER NEAR SAINT HELENA CRESTED ONE FOOT ABOVE FLOOD STAGE AT ABOUT 7 PM SUNDAY EVENING. SIGNIFICANT RISES ALSO OCCURRED ON THE LOWER NAPA RIVER AND THE RUSSIAN RIVER...BUT FOR THE MOST PART THESE NORTH BAY MAINSTEM RIVERS REMAINED WITHIN THEIR BANKS.

THE SAN LORENZO RIVER NEAR FELTON IN THE SANTA CRUZ MOUNTAINS

ROSE ONE AND A HALF FEET ABOVE FLOOD STAGE EARLY ON THE EVENING OF THE 23RD. FIFTY HOMES WERE EVACUATED IN THE FELTON GROVE AREA BUT ONLY MINOR FLOODING OCCURRED THERE. THE SAN FRANCISQUITO CREEK SPILLED LOCALLY OUT OF ITS BANKS AROUND 7 PM THAT EVENING...FLOODING A PORTION OF HIGHWAY 101 NORTH OF EMBARCADERO ROAD IN PALO ALTO. OTHER SMALL STREAMS AND CREEKS THAT REACHED BANKFULL ON THE AFTERNOON OR EVENING OF THE 23RD INCLUDED THE PETALUMA RIVER IN SONOMA COUNTY...THE PESCADERO CREEK IN SAN MATEO COUNTY...AND BOTH THE SOQUEL AND CORRALITOS CREEKS IN SANTA CRUZ COUNTY. ALTHOUGH THESE SMALL STREAMS AND CREEKS ROSE TO THEIR OFFICIAL FLOOD STAGES...THEY MOSTLY REMAINED WITHIN THEIR BANKS AND NO SIGNIFICANT FLOODING WAS REPORTED.

ANOTHER STORM SYSTEM SWEEPED ACROSS THE REGION FROM THE NORTHWEST ON CHRISTMAS DAY. THIS STORM DID NOT CONTAIN AS MUCH MOISTURE AS THOSE OF THE PREVIOUS WEEKEND...AND SO RAINFALL WAS MOSTLY LIGHT TO MODERATE IN INTENSITY.

RAIN TOTALS FOR DECEMBER WERE WELL ABOVE NORMAL. MOST CLIMATE STATIONS HAD MONTHLY RAIN TOTALS THAT WERE FROM 150 TO 200 PERCENT OF NORMAL. SEVERAL CLIMATE STATIONS ACCUMULATED MORE THAN DOUBLE THEIR AVERAGE DECEMBER RAINFALL.

JANUARY 2013:

JANUARY 2013 WAS ONE OF THE DRIEST JANUARIES ON RECORD ACROSS THE SAN FRANCISCO BAY AREA AND MONTEREY BAY AREA. FOR MUCH OF THE MONTH A RIDGE OF HIGH PRESSURE WAS LOCATED EITHER ALONG THE WEST COAST OR JUST OFFSHORE OVER THE EASTERN PACIFIC. THIS RIDGE PREVENTED PACIFIC WEATHER SYSTEMS FROM REACHING CALIFORNIA. THOSE FEW WEATHER SYSTEMS THAT DID MANAGE TO BREAK THROUGH TO THE WEST COAST WERE WEAK AND PRODUCED ONLY LIGHT AMOUNTS OF RAIN.

RAINFALL FROM JANUARY'S THREE LIGHT PRECIPITATION EVENTS WASN'T EVEN ENOUGH TO ADD UP TO AN INCH AT MOST CLIMATE STATIONS. RAIN TOTALS FOR THE MONTH WERE AS LITTLE AS 5 PERCENT OF NORMAL.

JANUARY 2013 WAS THE DRIEST JANUARY ON RECORD AT THE SAN FRANCISCO AIRPORT WHERE ONLY 0.20 INCHES OF RAIN FELL DURING THE MONTH. RAINFALL RECORDS AT SFO DATE BACK TO 1946.

JANUARY 2013 WAS AMONG THE TOP TEN DRIEST JANUARIES AT MORE THAN 20 CLIMATE STATIONS INCLUDING SAN FRANCISCO...OAKLAND AND SAN JOSE.

FEBRUARY 2013:

FEBRUARY 2013 WAS MUCH LIKE JANUARY...VERY DRY. THERE WERE ONLY TWO PRECIPITATION EVENTS DURING THE MONTH...AND BOTH PRODUCED ONLY LIGHT AMOUNTS OF RAINFALL. MOST CLIMATE STATIONS RECEIVED LESS THAN 20 PERCENT OF NORMAL FEBRUARY RAINFALL AND IN MANY CASES LESS THAN 10 PERCENT. THE NORTH BAY FARED THE WORST...ACCUMULATING A SCANT 4 TO 8 PERCENT OF NORMAL. CLIMATE STATIONS NEAR MONTEREY FARED THE BEST OF ANY IN THE REGION DURING FEBRUARY...BUT STILL ONLY MANAGED TO PICK UP ABOUT 15 TO 25 PERCENT OF NORMAL.

BECAUSE FEBRUARY WAS THE SECOND CONSECUTIVE MONTH OF MUCH BELOW NORMAL RAINFALL ...JANUARY-FEBRUARY COMBINED RAIN TOTALS WERE THE LOWEST ON RECORD FOR THE MAJORITY OF CLIMATE STATIONS ACROSS THE REGION. TWENTY-TWO CLIMATE STATIONS EXPERIENCED THEIR DRIEST JANUARY-FEBRUARY ON RECORD. IN MOST CASES...THE PREVIOUS RECORD DRY JANUARY-FEBRUARY WAS IN 1976.

MARCH 2013:

THE PROLONGED PERIOD OF DRY WEATHER PERSISTED THROUGH MARCH. THREE PRECIPITATION EVENTS DURING MARCH PRODUCED ONLY LIGHT AMOUNTS OF RAIN. MARCH WAS THE THIRD CONSECUTIVE MONTH WITH MUCH BELOW NORMAL RAINFALL.

AN UPPER LEVEL LOW APPROACHED THE COAST DURING THE FINAL FEW DAYS OF MARCH AND PRODUCED SCATTERED SHOWERS AND ISOLATED THUNDERSTORMS ON THE 30TH AND 31ST. MOST OF THE THUNDERSTORMS ON THE 30TH OCCURRED OVER DIABLO MOUNTAIN RANGE AND ON THE 31ST ACROSS THE NORTH BAY.

TWO DOZEN CLIMATE STATIONS EXPERIENCED THEIR DRIEST JANUARY-MARCH ON RECORD INCLUDING DOWNTOWN SAN FRANCISCO. SOME RECORDS WERE BROKEN BY A CONSIDERABLE AMOUNT. FOR INSTANCE...KENTFIELD PICKED UP ONLY 2.25 INCHES OF RAIN FROM JANUARY 1 THROUGH MARCH 31...MAKING JAN-MAR 2013 BY FAR THE DRIEST JANUARY-MARCH IN THE 111 YEARS OF WEATHER RECORDS AT KENTFIELD. THE PREVIOUS RECORD WAS 8.22 INCHES IN 1984.

APRIL 2013:

DRY WEATHER CONTINUED. RAINFALL TOTALS FOR THE MONTH WERE BELOW NORMAL AT NEARLY ALL CLIMATE STATIONS AND LESS THAN HALF OF NORMAL AT A MAJORITY OF LOCATIONS.

COMBINED RAIN TOTALS FOR THE FOUR MONTH PERIOD OF JANUARY THROUGH APRIL WERE GENERALLY ONLY 15 TO 25 PERCENT OF NORMAL. NEARLY TWO DOZEN CLIMATE STATIONS EXPERIENCED THEIR DRIEST JANUARY-APRIL ON RECORD

A RED FLAG WARNING WAS ISSUED FOR THE NORTH AND EAST BAY HILLS ON THE FINAL DAY OF APRIL DUE TO GUSTY OFFSHORE WINDS COMBINED WITH WARM AND DRY CONDITIONS AND ANOMALOUSLY DRY FUELS. IT IS VERY UNUSUAL FOR RED FLAG WARNINGS TO BE ISSUED SO EARLY IN THE YEAR. IN FACT...THE MONTEREY FORECAST OFFICE HAD NEVER BEFORE ISSUED RED FLAG WARNINGS PRIOR TO JUNE. THE PRIMARY REASON FOR SUCH AN EARLY ISSUANCE IN 2013 WAS THE PROLONGED FOUR MONTH PERIOD OF MUCH BELOW NORMAL RAINFALL WHICH RESULTED IN RECORD DRY FUELS FOR LATE APRIL.

MAY 2013:

THUNDERSTORMS DEVELOPED ACROSS NORTHERN AND CENTRAL CALIFORNIA ON MAY 5 AND 6. MOST OF THE THUNDERSTORM ACTIVITY WAS OVER THE HIGHER MOUNTAINS WELL TO THE NORTH AND EAST OF THE SAN FRANCISCO BAY AREA...BUT ISOLATED STORMS DID DEVELOP OVER THE BAY AREA AS WELL.

ON THE MORNING OF SUNDAY THE 5TH A LINE OF SHOWERS AND ISOLATED THUNDERSTORMS MOVED THROUGH THE NORTH AND EAST BAY. THEN...LATE ON THE AFTERNOON OF MONDAY MAY 6 AN ISOLATED THUNDERSTORM FORMED OVER NORTHEASTERN CONTRA COSTA COUNTY. THIS STORM PRODUCED BRIEF HEAVY RAIN AND SMALL HAIL NEAR ANTIOCH AND BRENTWOOD. SCATTERED SHOWERS AND THE ISOLATED THUNDERSTORM ON THE 6TH PRODUCED ABOUT A QUARTER INCH OF RAIN ACROSS PORTIONS OF THE NORTH AND EAST BAY. NAPA PICKED UP MORE THAN TWO-THIRDS OF THEIR MONTHLY RAINFALL TOTAL FROM ONE BRIEF SHOWER ON THE 6TH.

RAIN TOTALS FOR MAY 2013 CAME NO WHERE NEAR THE MONTHLY NORMALS...AND SEVERAL CLIMATE STATIONS PICKED UP NO MEASURABLE PRECIPITATION DURING THE MONTH. A FEW LOCATIONS IN THE NORTH AND EAST BAY MANAGED TO ACCUMULATE A QUARTER TO A THIRD OF THEIR AVERAGE MAY RAINFALL...BUT MOST LOCATIONS CAME IN AT UNDER 10 PERCENT OF NORMAL. MAY 2013 MARKED THE FIFTH CONSECUTIVE MONTH WITH BELOW NORMAL RAINFALL ACROSS THE REGION. COMBINED RAINFALL FOR JANUARY THROUGH MAY WAS THE LOWEST ON RECORD FOR MOST CLIMATE STATIONS.

JUNE 2013:

LATE ON THE NIGHT OF SUNDAY JUNE 9 AN UPPER LEVEL LOW TRACKED ACROSS THE CENTRAL CALIFORNIA COAST AND TRIGGERED WIDESPREAD THUNDERSTORM ACTIVITY ACROSS NORTHERN CALIFORNIA. PART OF THAT ACTIVITY INCLUDED AN AREA OF HIGH-BASED THUNDERSTORMS THAT TRACKED ACROSS THE NORTH BAY DURING THE EARLY MORNING HOURS OF MONDAY JUNE 10. ROUGHLY 400 CLOUD TO GROUND LIGHTNING STRIKES WERE DETECTED ACROSS SONOMA AND NAPA COUNTIES AND ADJOINING COASTAL WATERS EARLY THAT MONDAY MORNING...MAINLY BETWEEN 12:30 AM AND 3:00 AM. THESE STORMS WERE CLASSIFIED AS "DRY" THUNDERSTORMS BECAUSE THEY DROPPED LESS THAN A TENTH OF AN INCH OF RAIN IN MOST LOCATIONS. LIGHTNING FROM THESE STORMS IGNITED ABOUT 20 WILDFIRES ACROSS SONOMA COUNTY. FORTUNATELY...ALL OF THESE BLAZES WERE CONTROLLED QUICKLY AND DID NOT DAMAGE ANY HOMES OR OTHER STRUCTURES. A FEW LIGHTNING STRIKES ALSO OCCURRED ACROSS EASTERN ALAMEDA AND CONTRA COSTA COUNTIES EARLY ON THE MORNING OF THE 10TH.

BY LATE IN THE THIRD WEEK OF JUNE...SATELLITE DATA INDICATED THAT A PLUME OF VERY MOIST AIR WAS MOVING ACROSS THE PACIFIC. SATELLITE MEASUREMENTS INDICATED THAT THE MOISTURE CONTENT IN THIS PLUME WAS BETWEEN 200-300% OF NORMAL FOR JUNE. BY LATE ON THE 23RD RAIN BEGAN TO FALL ACROSS THE NORTH BAY. OVER THE NEXT 48 HOURS MOISTURE CONTINUED TO STREAM INLAND AND RAINFALL INTENSITY INCREASED ACROSS THE NORTH BAY BY THE EARLY MORNING HOURS OF TUESDAY JUNE 25. THE BULK OF THE RAIN FELL BETWEEN 1 AM AND 4 PM ON THE 25TH. OROGRAPHIC LIFT ENHANCED PRECIPITATION IN THE COASTAL MOUNTAINS OF THE NORTH BAY. RAINFALL TAPERED OFF LATE ON THE 25TH. BY THEN RAINFALL TOTALS WERE VERY IMPRESSIVE FOR LATE JUNE...AND ALSO RECORD-BREAKING. OVER FIVE INCHES OF RAIN FELL ON MOUNT TAMALPAIS IN MARIN COUNTY AND ALSO NEAR CAZADERO IN SONOMA COUNTY.

OROGRAPHIC ENHANCEMENT AND RAIN SHADOW EFFECTS RESULTED IN LARGE PRECIPITATION GRADIENTS WITH THE JUNE 25TH EVENT. FOR EXAMPLE...RAINFALL ON MOUNT TAMALPAIS WAS MORE THAN 10 TIMES GREATER THAN WHAT FELL IN SAN RAFAEL JUST FIVE MILES TO THE

NORTHEAST. IN ADDITION...THE MOST SIGNIFICANT MOISTURE AND LIFT WAS CONFINED TO THE NORTH BAY AND SO RAIN TOTALS DROPPED OFF SHARPLY SOUTH OF THE GOLDEN GATE.

RAINFALL ON JUNE 25 EASILY BROKE RAINFALL RECORDS FOR THE DATE. FOR EXAMPLE...1.38 INCHES OF RAIN IN KENTFIELD ON THE 25TH FAR EXCEEDED THE PREVIOUS RECORD OF 0.02 INCHES FOR THAT DATE.

BECAUSE OF THIS ANOMALOUS RAIN EVENT...MONTHLY RAIN TOTALS ACROSS MOST OF THE NORTH BAY WERE WELL ABOVE NORMAL FOR JUNE...MORE THAN 600 PERCENT OF NORMAL AT THE SONOMA COUNTY AIRPORT AND MORE THAN 900 PERCENT OF NORMAL AT OCCIDENTAL. NORTHERN SECTIONS OF THE EAST BAY AS WELL AS COASTAL PORTIONS OF THE SAN FRANCISCO PENINSULA ALSO ACCUMULATED GREATER THAN NORMAL RAINFALL IN JUNE...BUT IN LESS SPECTACULAR FASHION COMPARED TO THE NORTH BAY. ALL OTHER CLIMATE STATIONS RECEIVED BELOW NORMAL RAINFALL IN JUNE.

THE FOLLOWING IS A LISTING OF PRECIPITATION TOTALS FOR THE 2012-2013 RAIN YEAR...ALONG WITH NORMAL RAIN YEAR PRECIPITATION AND THE PERCENT OF NORMAL.

LOCATION	JULY 1- JUNE 30 TOTAL	NORMAL RAIN YR PRECIP	PERCENT OF NORMAL
NORTH BAY...			
ANGWIN	33.21	41.30	80
CALISTOGA	30.86	40.87	76
CLOVERDALE	33.97	43.13	79
KENTFIELD	33.09	47.98	69
NAPA	18.41	27.71	66
NAPA AIRPORT	9.76	20.39	48
OCCIDENTAL	43.33	56.99	76
PETALUMA AIRPORT	18.20	26.65	68
SAN RAFAEL	24.71	35.23	70
SONOMA COUNTY AP	28.93	36.28	80
SAN FRANCISCO PENINSULA...			
HALF MOON BAY	18.78	29.00	65
REDWOOD CITY	13.92	20.32	69
SAN FRANCISCO AIRPORT	12.89	20.65	62
SAN FRANCISCO DOWNTOWN	16.61	23.65	70
EAST BAY...			
BERKELEY	21.01	26.60	79
CONCORD	11.34	18.12	63
CONCORD AIRPORT	11.70	16.46	71
FREMONT	8.57	16.68	51
HAYWARD AIRPORT	7.47	18.04	41

LIVERMORE	10.39	15.23	68
LIVERMORE AIRPORT	10.41	15.71	66
MOUNT DIABLO			
JUNCTION	20.95	25.04	84
NEWARK	12.15	15.09	81
OAKLAND	16.54	23.96	69
OAKLAND AIRPORT	13.81	20.81	66
RICHMOND	18.87	24.93	76

SOUTH BAY AND SANTA CRUZ COUNTY...

BEN LOMOND	36.49	50.48	72
GILROY	14.67	20.54	71
LOS GATOS	11.08	23.08	48
MOFFETT FIELD	9.59	14.68	65
MOUNT HAMILTON	17.53	26.13	67
SAN JOSE	9.42	15.82	60
SANTA CRUZ	17.86	31.35	57
WATSONVILLE	13.92	23.50	59
WATSONVILLE AP	13.33	20.27	66

MONTEREY AND SAN BENITO COUNTIES...

BIG SUR STATION	28.04	44.88	62
CARMEL VALLEY	13.09	19.36	68
HOLLISTER	11.33	14.19	80
KING CITY	6.64	12.06	55
MONTEREY	13.12	21.10	62
MONTEREY AIRPORT	11.39	16.12	71
PINNACLES NM	8.68	17.24	50
SALINAS	10.88	15.45	70
SALINAS AIRPORT	8.97	12.83	70

NOTE: THIS CLIMATOLOGICAL DATA IS PRELIMINARY. FOR OFFICIAL
 CERTIFIED CLIMATOLOGICAL DATA PLEASE CONTACT THE NATIONAL
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DYKEMA